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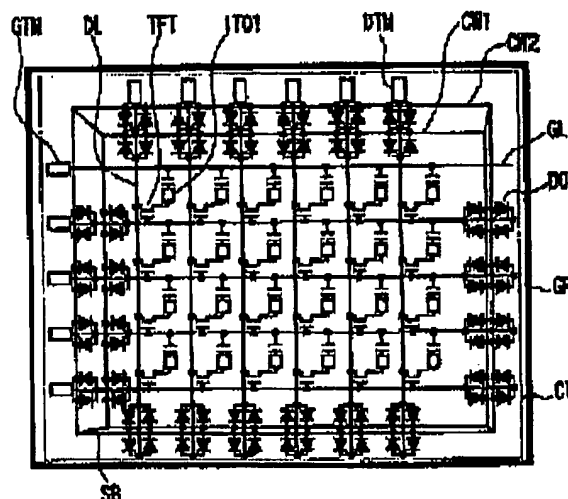
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TITLE : LIQUID CRYSTAL DISPLAY DEVICE
AND LIQUID CRYSTAL DISPLAY
SUBSTRATE



ABSTRACT : PROBLEM TO BE SOLVED: To compensate defects, such as short circuit of nonlinear resistance elements and disconnection of common lines, by adopting the constitution having an electrostatic protective circuit even after the cutting of a substrate.

SOLUTION: The annular double canon lines CW1, CW2 are formed on the outer periphery of a display region (pixel array). A pair of bidirectional diodes formed by combining diodes DO of a forward direction and backward direction are electrically connected to the respective intersected points of the first common line CW1 and a gate line GL and drain line DL. A pair of the bidirectional diodes are also arranged at the respective intersected points of the second canon line CW2 and the gate line GL and drain line DL. The bidirectional diodes are arranged at both ends of the gate wiring GL and the drain wiring DL and are connected to the common lines CW1, CW2. If a disconnection occurs in the common lines, the protective circuit function degrades but even if the one is disconnected, the protective circuit operates to improve a protective effect.

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XP-002283831**AN - 1998-134540 [13]****AP - JP19960162760 19960624****CPY - HISD****- HITA****DC - P81 U14****FS - GMPI;EPI****IC - G02F1/133 ; G02F1/136****MC - U14-K01A2 U14-K01A3****PA - (HISD) HITACHI DEVICE ENG CO LTD****- (HITA) HITACHI LTD****PN - JP10010493 A 19980116 DW199813 G02F1/133 016pp****PR - JP19960162760 19960624****XIC - G02F-001/133 ; G02F-001/136****XP - N1998-106364**

AB - J10010493 The device has a liquid crystal layer consisting of two liquid crystal display substrates, each containing several pixel electrodes (ITO1). Each substrate has gate wirings (GL) positioned horizontally across the surface of the substrate that intersects with drain wirings (DL) that are positioned vertically on the same surface. Display panels are then formed from the areas on which the gate and drain wirings intersect.

- Each gate and drain lines provided on each common line (CW1,CW2) formed along the periphery of each display panel are electrically-connected via the corresponding diodes (D0).

- **ADVANTAGE** - Enables correction of defects e.g. short-circuit diode, disconnection of common line, by providing circuit that provides static protection effect after display substrate is disconnected. Reduces space occupied by diodes due to sequential distribution of diodes across surface of substrate. Increases static inhibitory effect by forming closed loop electrically between adjacent parallel gate and drain lines via common line and corresponding diodes.

- (Dwg.1/13)

**IW - LIQUID CRYSTAL DISPLAY DEVICE ACTIVE MATRIX SYSTEM STATIC PROTECT
DIODE ELECTRIC CONNECT GATE DRAIN LINE COMMON LINE FORMING PERIPHERAL
DISPLAY AREA**

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DIODE ELECTRIC CONNECT GATE DRAIN LINE COMMON LINE FORMING PERIPHERAL
DISPLAY AREA**

NC - 001**OPD - 1996-06-24****ORD - 1998-01-16****PAW - (HISD) HITACHI DEVICE ENG CO LTD****- (HITA) HITACHI LTD**

**TI - Liquid crystal display device using active matrix system for static
protection - uses diodes to electrically connect gate and drain lines
of common lines formed in periphery of display area**

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